634584A YUL SYSTEM FOR 1800: REVISION 9 OF PROGRAM DIGEST BY SIR TOBY BELCH DEC 12, 1967

R0014 * HUGH BLAIR-SMITH / IL7-238E / EXT (1)215 / DECEMBER 1967

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R0032   EXAMPLES OF ALL CURRENTLY AVAILABLE YUL DIRECTOR CARD TYPES.  ON THIS PAGE: ASSEMBLY-TYPE DIRECTORS.
R00332 *-------------------------------------------------------------------------------------------------

R0034    Y  ANDY ASSEMBLE NEW BLK2 PROGRAM BUGFULL BY DR. TERRY-THOMAS
R00341 *Y  NAN  ASSEMBLE NEW AGC SEGMENT PIZZA BY JOE & NEMO
R0035    Y LYNN ASSEMBLE NEW AGC4 SUBROUTINE INTPRET BY MUNTZ

R0036    Y  YUL ASSEMBLE REVISION 15 OF AGC4 PROGRAM HIKE BY JFK
R00361 *Y  YUL ASSEMBLE REVISION 1 OF AGC SEGMENT SPLITFEE BY DR. CROOK
R0037    Y  NAN ASSEMBLE REVISION 112 OF BLK2 SUBROUTINE LEADON BY MACBETH

R0038    Y  EXP ASSEMBLE VERSION NEWBUGGY BY SOMEBODY ELSE
R0039    S       FROM REVISION 2 OF AGC4 PROGRAM BUGS BY BUNNY                (REQUIRED WITH VERSION ASSEMBLY)
R00401 *Y LYNN ASSEMBLE VERSION NEWSEG BY NEW FELLER
R00402 *S       FROM REVISION 0 OF SACO SEGMENT OLDSEG BY OLD FELLER          (REQUIRED WITH VERSION ASSEMBLY)
R0041    Y ANDY ASSEMBLE VERSION PINBALL BY A. I. GREEN
R0042    S       FROM REVISION 22 OF BLK2 SUBROUTINE BALLPEEN BY "POP" BUMPER (REQUIRED WITH VERSION ASSEMBLY)

R0044    Y 2NDF ASSEMBLE TRANSFERRED BLK2 PROGRAM DUSK BY NASA 2019999-099    (SEE TRANSFER VERB ON NEXT PAGE)
R0046    S       FROM PICKYOURFILENAME                                        (REQUIRED WITH TRANSFERRED ASSEMBLY)
R00471 *Y  FROZ ASSEMBLE TRANSFERRED AGC4 SEGMENT TWILIGHT BY NASA 1021199
R00472 *S       FROM DISCTWILIGHT                                            (REQUIRED WITH TRANSFERRED ASSEMBLY)
R0048    Y  YUL ASSEMBLE TRANSFERRED SACO SUBROUTINE DENTURES BY G. WASHINGTON
R0049    S       FROM WASPARTOFAPROG                                          (REQUIRED WITH TRANSFERRED ASSEMBLY)
R00501   S       UPGRADE TO REVISION 123                                      (OPTIONAL WITH TRANSFERRED ASSEMBLY)

R0051    Y FROZ REPRINT  REVISION 15 OF AGC4 PROGRAM HIKE BY JFK
R0052    S       FOR PIERRE SALINGER                                          (REQUIRED WITH REPRINT)
R00531 *Y  NAN  REPRINT NEW AGC SEGMENT CLIPPING BY XEROX
R00532 *S       FOR DENNISON                                                 (REQUIRED WITH REPRINT)
R0054    Y YUL  REPRINT REVISION 0 OF SACO SUBROUTINE CARIES BY TOOTH DECAY
R0055    S       FOR NOYS E. BORING, D.D.S.                                   (REQUIRED WITH REPRINT)

R00562  NOTES:   "REPRINT" REGENERATES AN ASSEMBLY LISTING BY GOING THROUGH AN ENTIRE ASSEMBLY, BUT WITHOUT MAKING ANY
R00564  CHANGE TO THE PERMANENT RECORD OF THE PROGRAM OR SUBROUTINE.  IT IS THE ONLY TASK THAT TAKES A "FOR WHOM" CARD.

R00566 *ANY OPERATION MAY BE DONE ON A FROZEN TAPE (FROZEYUL OR 2NDFROZE) EXCEPT "ASSEMBLE REVISION ..."

R0057   NON-ASSEMBLY DIRECTORS CLOSELY RELATED TO ASSEMBLY.

R0058    Y   YUL DELETE REVISION 0 OF BC PROGRAM BUGFULL BY DR. TERRY - THOMAS
R00581 *Y  EXP  DELETE REVISION 12 OF BLK2 SEGMENT BUGABOO BY SPOOK
R0059    Y LYNN DELETE REVISION 7 OF AGC4 SUBROUTINE BEDBUG BY SIMMONS

R00592  NOTE:    A SUBROUTINE THAT HAS BEEN CALLED BY AN EXISTING PROGRAM CANNOT BE DELETED.

R0060    Y  YUL CONTROL NEW SACO SUBROUTINE BICUSPID BY LEFTY CHOMP
R0061    S       AUTHORIZED BY PERCIVAL Q. NIBBLE                             (REQUIRED WITH SUBROUTINE CONTROL)
R0063    Y  NAN DECONTROL REVISION 256 OF BLK2 SUBROUTINE UNBRIDLE BY JIM ORGIES
R0064    S       AUTHORIZED BY IMA NOH PURITAN                                (REQUIRED WITH SUBROUTINE DECONTROL)

R00652  NOTE:    A CONTROLLED SUBROUTINE CANNOT BE EITHER REVISED OR DELETED.  AS WITH REPRINT, THE SUBDIRECTOR IS NOT
R00654  CHECKED BEYOND THE FIRST WORD, BUT IS TYPED OUT FOR THE RECORD.
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P0066 EXAMPLES OF YUL DIRECTOR CARD TYPES CONCLUDED. ON THIS PAGE: NON-ASSEMBLY AND INTERNAL-USE DIRECTORS.
R00672 ----------

R0068 *Y YUL MANUFACTURE REVISION 1 OF AGC PROGRAM SUNSET BY AS514 (SEE SECTION ON BLK2/AGC SUBDIRECTORS)
R00691 *Y ANDY MANUFACTURE NEW AGC SEGMENT ZOT BY JOHNNY HART

R0070 *NOTE: MANUFACTURING MAY BE DONE ONLY ON GOOD OR FAIR PROGRAM OR SEGMENT ASSEMBLIES. AN OLD REVISION CAN BE
R00702 *MANUFACTURED IF IT IS ON THE 1800'S DISC.

R0071 Y LYNN PRINT REVISION 2 OF AGC4 PROGRAM BUGS BY BUNNY (PRINT CARD IMAGES ONLY, LIKE 407)
R0072 Y LYNN PUNCH REVISION 2 OF AGC4 PROGRAM BUGS BY BUNNY (PUNCH CARDS SUITABLE FOR ASSEMBLY
R0073 Y LYNN PRINT, PUNCH REVISION 2 OF AGC4 PROGRAM BUGS BY BUNNY INPUT; SEE BOTTOM OF PAGE 5)
R0074 Y LYNN PUNCH, PRINT REVISION 2 OF AGC4 PROGRAM BUGS BY BUNNY
R00741 *Y FROZ PUNCH, PRINT REVISION 0 OF BLK2 SEGMENT FRAMMIS BY DINGBAT
R0075 Y LYNN PRINT, PUNCH NEW AGC4 SUBROUTINE INTPRET BY MUNTZ (I.E., PRINT OR PUNCH OR BOTH ARE OK.)

R0077 Y NAN TRANSFER NEW BLK2 PROGRAM DUSK BY NASA 2019999-099 (WRITE CARD IMAGES ON DISC)
R0078 S AS PICKYOURFILENAME (REQUIRED WITH TRANSFER)
R00791 *Y ANDY TRANSFER REVISON 3 OF AGC SEGMENT TWILIGHT BY WAGNER
R00792 *S AS DISCTWILIGHT (REQUIRED WITH TRANSFER)
R0080 Y EXP TRANSFER REVISION 12 OF AGC4 SUBROUTINE LEADON BY TEASER
R0081 S AS SOMEOTHERNAME (REQUIRED WITH TRANSFER)
R0083 Y YUL TRANSFER, PRINT NEW SACO PROGRAM CHEWCHEW BY EL MASTICATOR (OR "PRINT, TRANSFER")
R0085 S AS WASPARTOFAPROG (REQUIRED WITH TRANSFER)

R00862 NOTE: THE FILE MADE BY TRANSFER DOES NOT COMPETE WITH BINARY-RECORD FILES FOR DISC SPACE. ITS NAME CAN HAVE
R00864 UP TO 16 CHARACTERS ON THE 1800, BUT ONLY 14 CHARACTERS ON THE 360.

R0087 Y NAN MESSAGE TYPE THIS MESSAGE TO THE OPERATOR

R0088 MAINTENANCE OF YUL SYSTEM SOFTWARE STATUS -- INTERNAL USE.

R0089 Y ANDY ADD NEW COMPUTER NAME BLK2 ("NEW", "NAME", AND "MOD" ARE OPTIONAL)
R0091 Y LYNN REMOVE OLD COMPUTER NAME MOD 3C ("OLD", "NAME", AND "MOD" ARE OPTIONAL)

R0093 Y YUL ASSEMBLY PASS 1 FOR 3C IS AVAILABLE ("IS" IS OPTIONAL)
R0095 Y EXP ASSEMBLY PASS 2 FOR MOD BLK2 CHECKED OUT
R0096 Y FROZ ASSEMBLY PASS 3 FOR MOD 3C IS OBSOLETE
R0097 Y ANDY MANUFACTURING FOR BLK2 IS AVAILABLE
R0100 Y YUL ASSEMBLY PASS 3 FOR AGC4 = ASSEMBLY PASS 3 FOR MOD 3C
R0101 Y LYNN MANUFACTURING FOR MOD 4A = MANUFACTURING FOR AGC4

R0103 OPERATOR OPTIONS.

R0104 Y CREATE BACKUP
R01041 Y CLOSE MONAIN TAPE

P0105 OPTIONAL SUBDIRECTORS
R0106 ----------**------

R0107 PRINT CONTROL SUBDIRECTORS FOR USE IN "PRINT" (INCLUDING "TRANSFER, PRINT" AND "PUNCH, PRINT"), "REPRINT", OR
R0109 "ASSEMBLE" TASKS.

R0110 S PRINT 12 COPIES OF LISTING (LIMITS ARE 2 TO 63)
R0112 S PRINT 40 LINES PER PAGE (LIMITS ARE 10 TO 63, NORMAL IS 54)

R0114 NOTE: A COPIES REQUEST ASKS THE OPERATOR "WHAT PLY PAPER?" AND USES THE ANSWER TO MAKE AS MANY PRINTER RUNS
R0116 AS NECESSARY TO PROVIDE AT LEAST THE NUMBER OF COPIES REQUESTED. IN AN "ASSEMBLE" TASK, A BAD ASSEMBLY WILL CUT
R0118 OFF THE OUTPUT AFTER THE FIRST COMPLETE PRINTER RUN. NONE OF THIS IN ANY WAY AFFECTS MULTIPLE PRINTER RUNS ON
R0120 THE 2200 AS NOW PRACTICED FOR SUNDISK, SUNDANCE, AND COLOSSUS.

R0121 PRINT SUPPRESSION SUBDIRECTORS FOR USE IN "REPRINT" OR "ASSEMBLE" TASKS. THE "CONDITION" IS BAD ASSEMBLY.

R0123 S SUPPRESS INACTIVE SUBROUTINES
R0124 S SUPPRESS SYMBOL TABLE LISTING
R0125 S SUPPRESS OCTAL STORAGE MAP

R0126 S SUPPRESS CONDITIONALLY INACTIVE SUBROUTINES (EFFECTIVE AT FIRST FATAL CUSS)
R0128 S SUPPRESS CONDITIONALLY SYMBOL TABLE LISTING
R0129 S SUPPRESS CONDITIONALLY OCTAL STORAGE MAP

R0130 NOTE: REJECTED ASSEMBLY TURNS ON ALL SUPPRESSIONS AUTOMATICALLY. THERE ARE SOME EXCEPTIONS TO THE PRINT SUP-
R0132 PRESSION: IN INACTIVE SUBROUTINES, CUSSED LINES WITH THEIR CUSSES;

R0133 IN THE SYMBOL TABLE LISTING, UNHEALTHY SYMBOLS (ALL THOSE NOT DEFINED NORMALLY OR BY EQUALS);

R0135 IN THE OCTAL STORAGE MAP, THE OCCURRENCE OF A CUSS (*REF, *SIM, OR *EOB) REVOKES THE SUPPRESSION SO THAT THE
R0137 LINE WITH THE CUSS AND THE REST OF THE OCTAL MAP ARE PRINTED.

R0138 THE EXCEPTION TO THE EXCEPTION IS THAT IN A REJECT, OCTAL MAP CUSSES ARE NOT DETECTED, COUNTED, OR PRINTED.

P0140 OTHER SUBDIRECTORS FOR USE IN "ASSEMBLE" TASKS.

R0141 S RENUMBER CARDS
R0142 S FREEZE SUBROUTINES (PROGRAM ONLY)
R0144 S BEFORE SUBRNAME (SUBROUTINE ONLY)
R0146 S BEFORE ALL (SUBROUTINE ONLY)
R0148 S BEFORE END (SUBROUTINE ONLY)

R0150 NOTES: "RENUMBER" AFFECTS ALL THE CARDS OF THE MAIN PROGRAM OR SUBROUTINE, BUT NOT THOSE OF CALLED SUB-
R0152 ROUTINES. IT STARTS WITH 0001 AFTER EACH LOG CARD.

R0153 "FREEZE" CAUSES THE CARDS OF THE SUBROUTINES CALLED BY THE PROGRAM TO BECOME FULL-FLEDGED MEMBERS OF THE PRO-
R0155 GRAM, SO THAT THE SUBROUTINES MAY BE REVISED WITHOUT AGAIN AFFECTING THE PROGRAM. THE "SUBRO" CARDS ARE CON-
R0157 VERTED TO REMARKS.

R0158 "BEFORE" REQUESTS SPECIFY THE ORDER OF SUBROUTINES IN THE LIBRARY PORTION OF THE TAPE. THE SUBROUTINE BEING
R0160 ASSEMBLED MAY BE PLACED BEFORE A SPECIFIED SUBROUTINE FOR THE SAME COMPUTER, OR AT THE BEGINNING OR END. IF
R0162 NONE IS GIVEN, THE RULE IS:
R0163 REVISION . . . . . (AS IS)
R0164 NEW OR TRANSFERRED . . (BEFORE ALL)
R0165 VERSION. . . . . (AFTER SOURCE)

R0166 SYMBOLIC CARD IMAGE SELECTION PROCESS FOR PRINT, PUNCH, AND TRANSFER
R0167 ----------

R0168 IF DETAIL CARDS (MEANING ANYTHING NOT HAVING *, Y, OR S IN COLUMN 1) ARE INPUT TO A PRINT, PUNCH, OR TRANSFER
R0170 TASK, THEY WILL SELECT PARTS OF THE PROGRAM OR SUBROUTINE FOR OUTPUT. USUALLY, SUCH CARDS ARE LOG CARDS (L IN
R0172 COLUMN 1), SO THAT WHOLE LOG SECTIONS ARE OUTPUT. THE RULE IS: AS EACH DETAIL CARD ENTERS, THE SELECTION
R0174 PROCESS SCANS FORWARD FROM WHEREVER IT IS IN THE PROGRAM OR SUBROUTINE, LOOKING FOR A MATCH BUT IGNORING COLUMN
R0176 8 AND (IF THE DETAIL CARD IS A LOG CARD) IGNORING COLUMNS 2-7. THEN OUTPUT IS TURNED ON, STARTING WITH THE
R0178 FOUND CARD, UNTIL THE NEXT LOG CARD IS FOUND. OUTPUT IS TURNED OFF JUST BEFORE THAT LOG CARD, AND THE NEXT
R0180 DETAIL CARD IS EXAMINED. DETAIL CARDS MUST FOLLOW SUBDIRECTORS, IF ANY.

P0181 MANUFACTURING SUBDIRECTORS FOR BLK2 AND AGC ("TESTING" SERIES NOT INCLUDED)
R0182 ----------

R0183 ONE AND ONLY ONE OF THE FOLLOWING PRIMARY SUBDIRECTORS MUST FOLLOW THE YUL DIRECTOR CARD:

R0185 S PUNCH 36K CORE ROPE SIMULATOR TAPE (A)

R0186 S PUNCH RAYTHEON WIRING TAPE (B) (AUTHOR NAME MUST BEGIN WITH "NASA")
R0188 S PUNCH RAYTHEON TESTER TAPE (B) (AUTHOR NAME MUST BEGIN WITH "NASA")

R0190 S PUNCH MASTER DECK (C)
R0191 S PUNCH SYMBOL TABLE (C)
R0192 *S PUNCH SYMBOL TABLE AND MASTER DECK (C)
R01921 *S PUNCH SIMULATION DECK (C) (SEGMENT MANUFACTURING ONLY)

R0193 S COPY ONTO WORKER (D) (NEXT TASK MUST BE MANUFACTURE/COMPARE)
R0194 S COMPARE PROGRAM PROGNAME FROM WORKER (D) (USE SAME PARAGRAPH CARDS AS COPY TASK)

R0196 OTHER SUBDIRECTORS MAY OCCUR IN ANY ORDER PROVIDED THAT THEY ALL FOLLOW THE PRIMARY ONE. CLASSES (A), (B), AND
R0198 (D), ABOVE, REQUIRE EITHER

R0199 S PARAGRAPH ALL

R0200 OR ONE OR MORE OF THE FORM:

R0201 S PARAGRAPH 10 (PARAGRAPH NUMBERS IN OCTAL)
R0203 S PARAGRAPH 200 THRU 237
R0204 S PARAGRAPH 0 THROUGH 17

R0205 ERASABLE PARAGRAPHS (0-7) MAY NOT BE SPECIFIED FOR CLASS (B).

R0206 CLASSES (A) AND (B) MAY BE GIVEN ONE OF THE FOLLOWING:

R0207 S USE PINK OILED PAPER TAPE (ASSUMED IF NONE IS GIVEN)
R0209 S USE BLACK OILED PAPER TAPE
R0210 S USE BLUE MYLAR TAPE
R0211 S USE GREY FIBER TAPE
R0212 S USE GRAY FIBER TAPE
R0213 S USE ALUMINUM TAPE

R0214 CLASS (A) MAY INSTEAD BE GIVEN

R0215 S USE DIGISTORE TAPE
R0216 S USE DIGISTOR TAPE

R0217 THIS LAST IS INCREMENTALLY RECORDED MAGNETIC TAPE. TO POINT OUT THAT IT IS WRITTEN, NOT PUNCHED, IS TO PICK ONE
R0219 (1) NIT.

R0220 CLASS (B) REQUIRES ONE SUBDIRECTOR OF THE FORM

R0221 S MODULE DECK NUMBERS 00251 00262 00273 00284 00295 00306

R0222 WHERE THERE ARE 1 TO 6 GROUPS WRITTEN AS NNNNM. EACH NNNN IS A MODULE DECK NUMBER, OBTAINED FROM ART LAPOINTE,
R0224 AND EACH M IS A CORE ROPE MODULE NUMBER. THAT IS, NNNN IDENTIFIES THE MODULE, AND M SHOWS WHERE TO PLUG IT IN.
R0226 THIS CARD MUST BE CONSISTENT WITH THE PARAGRAPH REQUESTS.

R0227 CARD MERGING PROCESS USED IN "ASSEMBLE REVISION", "ASSEMBLE VERSION", AND "ASSEMBLE TRANSFERRED"
R0229 ----------

R0231 THESE THREE ASSEMBLY TYPES MUST MERGE A SET OF INCOMING CARDS WITH A PRE-EXISTING PROGRAM OR SUBROUTINE
R0233 FILE ON A YUL TAPE OR, IN THE CASE OF "ASSEMBLE TRANSFERRED", ON THE DISC. THE MERGING IS CONTROLLED BY THE
R0235 CARD NUMBERS AS FAR AS POSSIBLE, BUT SOME SPECIAL CARD TYPES, SUCH AS "DELETE", ARE ALSO NEEDED; THESE ARE
R0237 CALLED "MERGE CONTROL CARDS". THE DISTINCTION IS THAT MERGE CONTROL CARDS DO NOT REMAIN IN THE PROGRAM; THEY
R0239 MAY APPEAR ONCE IN A LISTING AND THEN DISAPPEAR.

R0240 MERGING IS STRICTLY UNIDIRECTIONAL, LIKE THE MERGING OF TRAFFIC ON A SUPERHIGHWAY WITH TRAFFIC ENTERING
R0242 FROM AN "ON RAMP". ONCE A CARD IS ACCEPTED INTO THE ASSEMBLY, WHETHER FROM THE PRE-EXISTING FILE OR FROM THE
R0244 INPUT, IT CANNOT AGAIN AFFECT THE MERGING PROCESS OR BE AFFECTED BY IT (THOUGH IT MIGHT BE RENUMBERED IN ACCORD-
R0246 ANCE WITH AN EARLIER REQUEST). IN THE FOLLOWING PARAGRAPHS I SHALL SAY SOMETHING ABOUT THE MORE DIFFICULT OR
R0248 CONFUSING ASPECTS OF MERGING AND SKIM OVER THE EASY PARTS.

R0249 SEQUENCE BREAKS

R0250 MOST YUL PROGRAMS CONSIST OF SEVERAL SETS OF CARDS WITH ASCENDING SEQUENCES OF CARD NUMBERS, SEPARATED
R0252 BY LOG CARDS (IDENTIFIED BY "L" IN COLUMN 1), OR MORE RARELY, BY CARDS WITH "SEQBRK" OR "999999" IN THE CARD
R0254 NUMBER FIELD. THESE SEPARATORS ARE KNOWN COLLECTIVELY AS "SEQUENCE BREAKS" BECAUSE THEY PRESENT A CARD NUMBER
R0256 VALUE OF 999999 TO THE MERGING PROCESS BEFORE BEING ACCEPTED INTO THE ASSEMBLY, BUT A VALUE OF 000000 AFTER
R0258 BEING ACCEPTED. AN INCOMING SEQUENCE BREAK WILL REPLACE A PRE-EXISTING SEQUENCE BREAK JUST AS ANY INCOMING PRO-
R0260 GRAM CARD WILL REPLACE A LIKE-NUMBERED CARD.

R0261 ACCEPTOR CARDS

R0262 THE MOST FREQUENTLY USED MERGE CONTROL CARD IS IDENTIFIED BY "=" IN COLUMN 1. IT IS PROPERLY CALLED AN
R0264 "ACCEPTOR CARD", BUT IS POPULARLY KNOWN AS AN "=LOG CARD" OR, CONFUSINGLY, AS A "LOG CARD". THE SIGNIFICANCE OF
R0266 THE "=" IS: GO FIND A CARD EQUAL TO THIS ACCEPTOR CARD AND ACCEPT IT INTO THE ASSEMBLY WITHOUT CHANGE, ALSO AC-
R0268 CEPTING ALL CARDS PASSED OVER IN THE SEARCH. NOW, WHAT DOES IT MEAN TO SAY THAT ONE CARD IS EQUAL TO ANOTHER?
R0270 EQUALITY OF CARD NUMBERS IS NOT ALWAYS ENOUGH, BECAUSE MOST YUL PROGRAMS HAVE SEVERAL SEQUENCES OF CARD NUMBERS.
R0272 WE USE A STRONGER EQUALITY, OF BOTH CARD NUMBER AND TEXT (COLUMNS 9-80). FINE SO FAR, BUT LOG CARDS HAVE NO
R0274 CARD NUMBERS (BY DEFINITION), SO WHAT DO WE WRITE TO ACCEPT A LOG CARD? WE SAY EXPLICITLY THAT WE WANT A LOG
R0276 CARD, BY PUNCHING "LOG" IN THE CARD NUMBER FIELD, AND THEN SPECIFY WHICH LOG CARD BY PUNCHING THE TEXT AS WELL.
R0278 HENCE THE FAMILIAR "=LOG" CARD, WHOSE FUNCTION IS TO SCAN THROUGH ANY NUMBER OF LOG SECTIONS IN SEARCH OF A PAR-
R0280 TICULAR LOG CARD--A JOB THAT COULD NOT BE DONE BY A SEARCH BASED ON CARD NUMBER ALONE.

R0282 THE ACCEPTOR CARD IS THE ONLY CARD TYPE THAT IS NOT PRINTED IN THE ASSEMBLY LISTING; INSTEAD IT MARKS
R0284 THE FOUND CARD WITH "@" IN COLUMN 8, THUS CALLING ATTENTION TO THE SAME INFORMATION AS THAT ON THE ACCEPTOR
R0286 CARD. IT IS POSSIBLE TO ACCEPT A NON-LOG CARD BY USING THE CARD NUMBER AND THE TEXT, BUT NOBODY EVER DOES.

R02871 INSERTION CARDS

R02872 ANOTHER TYPE OF MERGE CONTROL CARD THAT SHOULD BECOME POPULAR HAS THE OP CODE "INSERT". IT IS USED TO
R02873 INSERT ANY NUMBER OF UNNUMBERED OR ILL-NUMBERED CARDS (EVEN SEVERAL LOG SECTIONS IF DESIRED) IN ONE PLACE, E.G.:

```
02874  1234   BEGIN    INSERT                                  (TURNS ON RENUMBERING, STARTING WITH
02875  (. . . NEW CARDS . . .)                                 1234 IF IT HAD BEEN OFF)
02876           END     INSERT                                  (RENUMBERING STAYS TO END OF LOG SECT)

02877  123456 BEGIN    INSERT WITH 1235      (OTHERWISE NEW NUMBERS WOULD BE 123456, 123556, 123656, ...., XXXX56).
```

P0288 PARTIAL RENUMBERING

R0289 THE OP CODE "CARDNO" WAS DEVELOPED TO ALLOW A SINGLE CARD NUMBER TO BE CHANGED, AND THE PLURAL FORM
R0291 "CARDNS" EXTENDS THE RENUMBERING TO THE END OF THE LOG SECTION, EVEN RENUMBERING NON-LOG SEQUENCE BREAKS AS IT
R0293 GOES. THE NEW NUMBERS GO UP BY 0001 FOR EACH CARD. TO RENUMBER A WHOLE LOG SECTION WHOSE FIRST CARD IS 0001:

```
 0295  =LOG    NAME OF LOG SECTION
 0296   0001   CHANGE   CARDNS TO 1
```

R0297 THE RENUMBERING MAY BE RESTARTED SEVERAL TIMES, BUT IT WILL NOT STOP UNTIL IT FINDS THE NEXT LOG CARD, OR UNTIL
R02981 IT'S TURNED OFF BY A "PRESERVE CARDNS" CARD.

```
 0299  =LOG    NAME OF LOG SECTION
 0300   0001   CHANGE   CARDNS TO 1
 0301   2000   CHANGE   CARDNS TO 2000
 0302   4000   CHANGE   CARDNS TO 5000
 0303   6000   PRESERVE CARDNS                    (REJECTS IF RENUMBERING HAD PASSED 6000)
```

R0304 MANIPULATION OF WHOLE LOG SECTIONS

R0305 TO DELETE A LOG SECTION WHOSE LAST CARD IS NUMBERED 1234:

```
 0306  =LOG    NAME OF PRECEDING LOG SECTION
 0307   SEQBRK          DELETE THROUGH 1234
```

R0308 TO ADD A NEW LOG SECTION AFTER ANY EXISTING ONE:

```
 0309  =LOG    NAME OF PRECEDING LOG SECTION      (OMIT IF NEW SECTION WILL BE FIRST SEC)
 0311  T       NAME OF NEW LOG SECTION            ("T" CARD IS MERGED JUST AHEAD OF A SEQ-
 0313  (0001   ETC... CARDS OF NEW LOG SECTION)   UENCE BREAK AND THEN BECOMES "L" CARD)
```

R0314 TO COMBINE TWO ADJACENT LOG SECTIONS:

```
 0315  =LOG    NAME OF FIRST LOG SECTION
 03155  0001   CHANGE   CARDNS TO 1
 0316  PSEQBRK NAME OF SECOND LOG SECTION          (REPLACES LOG CARD)
```

R0321 TO SPLIT A LOG SECTION:

```
 0322  =LOG    NAME OF LOG SECTION
 0323   123499 BEGIN    INSERT
 0324  L       NAME OF NEW LOG SECTION
 0325          END      INSERT
```

R0326 TO CHANGE THE NAME OF A LOG SECTION:

```
 0327  =LOG    NAME OF PRECEDING LOG SECTION
 0328  L       NEW NAME OF LOG SECTION            (NEW LOG CARD REPLACES OLD ONE)
```

R03281 THERE IS NEVER ANY NEED FOR TWO "=LOG" CARDS WITH THE SAME TEXT IN AN INPUT DECK, UNLESS FOR SOME QUEER REASON
R03283 THERE ARE TWO LOG SECTIONS WITH THE SAME NAME. ONCE THE MERGING HAS ENTERED A LOG SECTION, YOU CANNOT ACCEPT
R03285 ITS LOG CARD AGAIN--THAT WOULD INVOLVE GOING BACKWARDS, WHICH YUL MERGING NEVER DOES. FOR EXAMPLE, THERE COULD
R03287 BE A CARD BETWEEN THE "=LOG" AND THE "T", ABOVE, SAYING SOMETHING LIKE " 0123 CA POSMAX ".

P0329 REJECTED ASSEMBLY (BAD MERGE)

R0330 WHEN THE MERGING PROCESS IS UNABLE TO FOLLOW THE PROGRAMMER'S DIRECTIONS EXACTLY, IT ABANDONS ANY AT-
R0332 TEMPT TO CONTINUE MERGING, AND PROTECTS THE FILE, THUS REVOKING THE TENTATIVE MERGING UP TO THE POINT OF REJEC-
R0334 TION. THE PRINTED OUTPUT SHOWS THE EFFECT ON THE PROGRAM OR SUBROUTINE OF THE TEMPORARILY MERGED CARDS.
R0336 REJECTION IS GENERALLY CAUSED BY:

R0337 (1) INPUT CARD NUMBERS OUT OF SEQUENCE (BUT NOTE THAT SEQUENCES LIKE
R0339 0123 DELETE
R0340 012201 CA ZERO
R0341 CAN BE LEGAL BECAUSE THE SECOND CARD'S NUMBER IS TESTED AFTER THE DELETION IS DONE),

R0343 (2) ATTEMPT TO DELETE OR RENUMBER A NON-EXISTENT CARD,

R0344 (3) MIS-SPELLED OR MIS-PUNCHED TEXT IN AN ACCEPTOR CARD, OR

R0345 (4) ILLEGAL FORMAT IN A MERGE CONTROL CARD.

R0346 THE INPUT CARDS THAT COME AFTER THE REJECTION ARE LISTED AND THEIR CARD NUMBER SEQUENCE IS CHECKED, ALLOWING FOR
R0348 THE EXCEPTION IN (1).

R0349 THERE IS A WAY TO GET ILL-ORDERED CARD NUMBERS WITHOUT A REJECT: BY CHANGING A CARD NUMBER TO A VALUE
R0351 SMALLER THAN ITS PREDECESSOR. TO RECOVER FROM SUCH CASES, THE FOLLOWING FORMS ARE PROVIDED:

```
 0353   0123   OUTOFSEQ DELETE
 0354   0123   OUTOFSEQ DELETE THRU  0133

 0355   0123   CORRECT  CARDNO TO 132
 0356   0123   CORRECT  CARDNS TO 132
```

R0357 THE SPECIAL FORMS ARE NEEDED TO MAKE THE MERGING PROCESS SEEK AN ILL-ORDERED CARD WITH THE DESIRED NUMBER, POSS-
R0359 IBLY IGNORING A WELL-ORDERED CARD WITH THE SAME NUMBER ON THE WAY.

## THE GREAT BIG BAD SECRET

THE TIME HAS COME TO UNSCREW THE INSCRUTABLE, EFFECTUATE THE INEFFABLE, UNPACK THE IMPECCABLE REDUNDANTLY RAVISHING REDOLENT RIDDLE, TO WIT: HOW DIFFERS SUPERB FROM GOOD? ... AND REVEAL THE RELATED IRRELEVANT RODOMONTADE. IT IS WITH A SOLEMN SENSE OF THE DISGRACEFUL DEGRADATION IT WILL IMPOSE ON MY JOB SECURITY THAT I DO THIS, BUT IF THE NASCENT NEUROSES FORMING AROUND THIS QUESTION ARE ALLOWED TO ESCALATE INTO PSORIATIC PSYCHOSES... WELL, IT JUST WON'T DO, THAT'S ALL.

BASICALLY, THE SCHEME IS QUITE SIMPLE, IF JUST A SHADE OBSCURE. REJECTED ASSEMBLIES YOU KNOW ABOUT, AND SUBROUTINES ARE NEVER RATED FOR QUALITY. PROGRAM ASSEMBLIES ARE RATED ACCORDING TO THE ORDER OF MAGNITUDE OF THE NUMBER OF CUSSED LINES, AND A PSEUDO-RANDOM VARIABLE. FOR MOST CASES, THERE ARE TWO LISTS OF WORDS. ONE LIST IS CHOSEN AT THE BEGINNING OF PASS 3, IN A PSEUDO-RANDOM WAY.

| LIST 1 | LIST 2 | QUALITY |
|---|---|---|
| GOOD | SUPERB | NO CUSSES |
| FAIR | SO-SO | ANY NUMBER OF NON-FATAL CUSSES |
| BAD | DISMAL | 1 OR 2 CUSSED LINES |
| LOUSY | AWFUL | 3 TO 9 CUSSED LINES |
| ROTTEN | VILE | 10 TO 99 CUSSED LINES |
| BILIOUS | PUTRID | 100 TO 999 CUSSED LINES |

AT THE END OF THE ASSEMBLY, THE APPROPRIATE WORD FROM THE SELECTED LIST IS TYPED OUT IN THIS FORM:

LOUSY ASSEMBLY; FILED ON DISC

IF THERE ARE 1000 OR MORE CUSSED LINES, INCLUDING SOME FATAL CUSSES, THE YUL SYSTEM IS AT A LOSS FOR WORDS, AND SIMPLY TYPES

YUCCCHHHH

NOW ABOUT THAT PSEUDO-RANDOM VARIABLE: IT IS COMPUTED BY A SINGLE EXCLUSIVE-OR INSTRUCTION FROM THE PAGE NUMBER OF THE LAST PAGE WITH PROGRAM CODING ON IT (THAT IS, THE LAST PAGE BEFORE THE SYMBOL TABLE LISTING) AND THE FIRST AVAILABLE ADDRESS IN THE SYMBOL TABLE. THE LATTER IS EQUIVALENT TO THE NUMBER OF H-1800 WORDS IN THE SYMBOL TABLE, BECAUSE THE VARIABLE IS THE SECOND BIT FROM THE RIGHT IN THAT EXCLUSIVE-OR RESULT. IF THE BIT IS ZERO, LIST 2 IS SELECTED. THE NUMBER OF WORDS IN THE SYMBOL TABLE IS $3(SYMS+MULTDEFS+SUBROS+COUNTS+1)$, WHERE

SYMS = NUMBER OF SYMBOLS AS SHOWN IN THE SYMBOL TABLE SUMMARY,

MULTDEFS = NUMBER OF MULTIPLY DEFINED SYMBOLS, NOT AS IN THE SYMBOL TABLE SUMMARY, BUT SUCH THAT A SYMBOL DEFINED N TIMES CONTRIBUTES N UNITS TO SYMS AND ONE UNIT TO MULTDEFS,

SUBROS = NUMBER OF SUBROUTINES CALLED, AND

COUNTS = NUMBER OF ROUTINES WHOSE WORDS ARE COUNTED.

I GUESS I SHOULD HAVE EXPLAINED HERE THAT THE PAGE NUMBER IS IN BINARY CODED DECIMAL, SO THE PART OF IT THAT ENTERS THE EXCLUSIVE-OR IS A BIT IN THE UNITS DIGIT. THE NUMBER OF WORDS IN THE SYMBOL TABLE IS KEPT IN BINARY. TO VERIFY THE LIST CHOICE, COMPUTE THE SYMBOL TABLE SIZE IN DECIMAL AND CONVERT THAT NUMBER TO OCTAL. NOW IF THE UNITS DIGIT OF THE OCTAL NUMBER BELONGS TO THE SET (2,3,6,7) AND THE UNITS DIGIT OF THE PAGE NUMBER DOES NOT, OR VICE VERSA, LIST 1 IS CHOSEN; IF BOTH DIGITS BELONG OR NEITHER BELONGS, LIST 2 IS CHOSEN.

R0001 SUFFIX 01 CODES, INDEXABLE (EXCEPT SETPD) BY ADDING 10 TO SUFFIX. FOR A KEY TO DATA MODES, SEE PAGE 2.

| R0002 R0003 | | | ADDR TYPE | PUSH UP | MODE IN | OP MODE | MODE OUT | RH OP | OCT CODE | OCT* CODE | ALTERNATE SPELLING |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0005 | 00 | VLOAD | A14 | YES | - | V | V | | 001 | 003 | |
| 0007 | 01 | TAD | A14 | YES | DT | T | - | | 005 | 007 | |
| 0009 | 02 | SIGN | E | YES | - | D | - | | 011 | 013 | |
| 0011 | 03 | VXSC | A14 | YES | DT/V | V/D | V | | 015 | 017 | |
| 0013 | 04 | CGOTO | E+F | NO | - | S | U | YES | 021 | 023 | |
| 0015 | 05 | TLOAD | A14 | YES | - | T | T | | 025 | 027 | |
| 0017 | 06 | DLOAD | A14 | YES | - | D | D | | 031 | 033 | |
| 0019 | 07 | V/SC | A14 | YES | DT/V | V/D | V | | 035 | 037 | |
| 0021 | 10 | SLOAD | A14 | NO | - | S | D | | 041 | 043 | |
| 0023 | 11 | SSP | E+C | NO | - | S | - | | 045 | 047 | |
| 0025 | 12 | PDDL | A14 | YES | - | D | D | | 051 | 053 | |
| 0027 | 13 | MXV | A14 | NO | V | M | - | | 055 | 057 | |
| 0029 | 14 | PDVL | A14 | YES | - | V | V | | 061 | 063 | |
| 0031 | 15 | CCALL | E+F | NO | - | S | U | YES | 065 | 067 | |
| 0033 | 16 | VXM | A14 | NO | V | M | - | | 071 | 073 | |
| 0035 | 17 | NORM | E | NO | DT | S | - | | 075 | 077 | SLC |
| 0036 | 20 | DMPR | A14 | YES | DT | D | D | | 101 | 103 | |
| 0038 | 21 | DDV | A14 | YES | DT | D | - | | 105 | 107 | |
| 0040 | 22 | BDDV | A14 | YES | DT | D | - | | 111 | 113 | |
| 0042 | 23 | (GEN SHIFT) | | | | | | | | | |
| 0044 | 24 | VAD | A14 | YES | V | V | - | | 121 | 123 | |
| 0046 | 25 | VSU | A14 | YES | V | V | - | | 125 | 127 | |
| 0048 | 26 | BVSU | A14 | YES | V | V | - | | 131 | 133 | |
| 0049 | 27 | DOT | A14 | YES | V | V | D | | 135 | 137 | |
| 0050 | 30 | VXV | A14 | YES | V | V | - | | 141 | 143 | |
| 0052 | 31 | VPROJ | A14 | YES | V | V | - | | 145 | 147 | |
| 0054 | 32 | DSU | A14 | YES | DT | D | - | | 151 | 153 | |
| 0055 | 33 | BDSU | A14 | YES | DT | D | - | | 155 | 157 | |
| 0056 | 34 | DAD | A14 | YES | DT | D | - | | 161 | 163 | |
| 0057 | 35 | | | | | | | | | | |
| 0058 | 36 | DMP | A14 | YES | DT | D | - | | 171 | 173 | |
| 0059 | 37 | SETPD | E | NO | - | S | - | | 175 | --- | |
| 0060 | 40 | CCLRB | E+F | NO | - | S | B | YES | 065 | 067 | |

ADDRESS CODES
(167777 WILL BE LAST ACM ADDR)

A14 ANY 14-BIT ADDRESS -- 0-52, 100-3777, IN 17 OR LESS THEN 20000-47776, IF LOCATION IN BANK 21 OR MORE THEN 52000-167777. STORED IN ARC-CCS FASHION, COMPLEMENTED IF INDEXED BY X2.
*** SEE ALSO E & F BELOW. ***

E ERASABLE -- 0-52, 100-3777. STORED IN ARC-CCS FASHION, COMPLEMENTED IF INDEXED BY X2. ********** ALL INTERPRETIVE ADDRESSES REFERRING TO ERASABLE ARE PUT INTO ADRES (10 BIT) FORM AND ARE CHECKED FOR CORRECT EBANK.

F FIXED -- 20000-167777. STORED AS IS. ********** ALL INTERPRETIVE ADDRESSES REFERRING TO FIXED ARE PUT INTO FCADR FORM BEFORE ALTERATIONS SUCH AS TRUNCATING TO 14 BITS.

C CONSTANT -- ANY TYPE OF SINGLE-PRECISION CONST. STORED AS IS.

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RH OP: INDICATES THOSE CODES THAT SHOULD BE RIGHT-HAND OPERATORS, OR OTHERWISE SHOULD BE ACCOMPANIED BY A BLANK RIGHT-HAND OPERATOR.

R0061 GENERAL SHIFT CODES, SUFFIX 01 CODE 23.

**** DEFINITION: ARC-CCS(X) = X + SGN(X)

| R0062 | | | MODE | UAL | UAU | IAL | IAU | ADAD | OCT | OCT* |
|---|---|---|---|---|---|---|---|---|---|---|
| 0064 | 0 | SL | DT | -51 | 51 | -177 | 177 | 00200 | 115 | 117 |
| 0066 | 1 | SR | DT | -51 | 51 | -177 | 177 | 00600 | 115 | 117 |
| 0068 | 2 | SLR | D | -34 | 15 | -177 | 177 | 01200 | 115 | 117 |
| 0070 | 3 | SRR | D | -15 | 34 | -177 | 177 | 01600 | 115 | 117 |
| 0072 | 4 | VSL | V | -34 | 33 | -177 | 177 | 00200 | 115 | 117 |
| 0074 | 5 | VSR | V | -33 | 34 | -177 | 177 | 00600 | 115 | 117 |

ADDRESS CODES

UAL -- UNINDEXED ADDRESS LOWER LIMIT
UAU -- UNINDEXED ADDRESS UPPER LIMIT
IAL -- INDEXED ADDRESS LOWER LIMIT
IAU -- INDEXED ADDRESS UPPER LIMIT
ADAD -- ADDITIVE FOR ADDRESS
FINISHED ADDRESS STORED LIKE A14 OR E.

P0078 SUFFIX 10 CODES, NOT INDEXABLE.

| R0079 R0080 | | | ADDR TYPE | MODE OUT | RH OP | OCT CODE | ALTERNATE SPELLING |
|---|---|---|---|---|---|---|---|
| 0082 | 00 | AXT,2 | C | - | | 002 | |
| 0084 | 01 | AXT,1 | C | - | | 006 | |
| 0086 | 02 | AXC,2 | C | - | | 012 | |
| 0088 | 03 | AXC,1 | C | - | | 016 | |
| 0090 | 04 | LXA,2 | E | - | | 022 | |
| 0091 | 05 | LXA,1 | E | - | | 026 | |
| 0093 | 06 | LXC,2 | E | - | | 032 | |
| 0095 | 07 | LXC,1 | E | - | | 036 | |
| 0096 | 10 | SXA,2 | E | - | | 042 | |
| 0098 | 11 | SXA,1 | E | - | | 046 | |
| 0100 | 12 | XCHX,2 | E | - | | 052 | |
| 0101 | 13 | XCHX,1 | E | - | | 056 | |
| 0102 | 14 | INCR,2 | C | - | | 062 | |
| 0104 | 15 | INCR,1 | C | - | | 066 | |
| 0106 | 16 | TIX,2 | A | - | | 072 | |
| 0107 | 17 | TIX,1 | A | - | | 076 | |
| 0108 | 20 | XAD,2 | E | - | | 102 | |
| 0109 | 21 | XAD,1 | E | - | | 106 | |
| 0110 | 22 | XSU,2 | E | - | | 112 | |
| 0111 | 23 | XSU,1 | E | - | | 116 | |
| 0112 | 24 | BZE | A | - | | 122 | |
| 0113 | 25 | GOTO | A | U | YES | 126 | GO TO |
| 0114 | 26 | BPL | A | - | | 132 | |
| 0115 | 27 | BMN | A | - | | 136 | |
| 0116 | 30 | CALL | A | U | YES | 142 | |
| 0117 | 31 | STQ | E | - | | 146 | ITA |
| 0118 | 32 | RTB | F | U | | 152 | |
| 0119 | 33 | BHIZ | A | - | | 156 | |
| 0120 | 34 | (SWITCH CODES) | | | | | |
| 0121 | 35 | | | | | | |
| 0122 | 36 | BOVB | F | - | | 172 | |
| 0123 | 37 | BOV | A | - | | 176 | |
| 012301 | 40 | CALRB | A | B | YES | 142 | |

ADDRESS CODES

A ANY 15-BIT ADDRESS -- 0-52, 100-3777, 20000-167777. STORED AS IS.

E ERASABLE -- 0-52, 100-3777. STORED AS IS.

F FIXED -- 20000-167777. STORED AS IS.

C CONSTANT -- ANY TYPE OF SINGLE-PRECISION CONST. STORED AS IS.

R01231 MODES IN

R01232 - DON'T CARE
R01233 D DOUBLE
R01234 DT DOUBLE OR TRIPLE
R01235 V VECTOR
R01236
R01237 NOTE THAT FOR VXSC AND V/SC,
R01238 IF MODE IN = DT, OP MODE = V, AND IF MODE IN = U OR V, OP MODE = D.

OPERAND MODES (FOR BEWARING AND BANK)

D DOUBLE (2 WORDS)
M MATRIX (18 WORDS)
S SINGLE (1 WORD)
T TRIPLE (3 WORDS)
V VECTOR (6 WORDS)

MODES OUT

- NO CHANGE
B UNKNOWN, REQUIRE BASIC INSTR. NEXT.
D DOUBLE
I UNKNOWN, REQUIRE INTERPRETIVE NEXT.
T TRIPLE
U UNKNOWN
V VECTOR

P0124 SWITCH CODES, SUFFIX 10 CODE 34.

| R0125 R0126 | | | ADDR TYPE | MODE OUT | RH OP | OCT CODE | ADDRESS ADDITIVE | ALTERNATE SPELLING |
|---|---|---|---|---|---|---|---|---|
| 0128 | 00 | BONSET | SW+A | - | | 162 | 00000 | |
| 0130 | 01 | SETGO | SW+A | U | YES | 162 | 00020 | |
| 0132 | 02 | BOFSET | SW+A | - | | 162 | 00040 | |
| 0134 | 03 | SET | SW | - | | 162 | 00060 | |
| 0136 | 04 | BONINV | SW+A | - | | 162 | 00100 | |
| 0138 | 05 | INVGO | SW+A | U | YES | 162 | 00120 | |
| 0140 | 06 | BOFINV | SW+A | - | | 162 | 00140 | |
| 0142 | 07 | INVERT | SW | - | | 162 | 00160 | INV |
| 0144 | | | | | | | | |
| 0146 | 10 | BONCLR | SW+A | - | | 162 | 00200 | |
| 0148 | 11 | CLRGO | SW+A | U | YES | 162 | 00220 | |
| 0150 | 12 | BOFCLR | SW+A | - | | 162 | 00240 | |
| 0152 | 13 | CLEAR | SW | - | | 162 | 00260 | CLR |
| 0154 | 14 | BON | SW+A | - | | 162 | 00300 | |
| 0155 | 16 | BOFF | SW+A | - | | 162 | 00340 | BOF |

ADDRESS CODES

A ANY 15-BIT ADDRESS -- 0-52, 100-3777, 20000-167777. STORED AS IS.

SW SWITCH BIT NUMBER -- 0-357. STORED WITH SWITCH WORD NUMBER 0-17 (THE INTEGER QUOTIENT OF N/15) IN BITS 12-9 AND THE BIT-WITHIN-WORD NUMBER (00-16 OCTAL, THE REMAINDER OF N/15) IN BITS 4-1. THIS IS THE ONLY INSTANCE OF NUMBERING BITS FROM LEFT TO RIGHT. 357 = 239D.

R0156 SUFFIX 000 CODES, UNARY OPERATIONS.

| R0157 R0158 | | | MODE IN | MODE OUT | RH OP | OCT CODE | ALTERNATE SPELLING | |
|---|---|---|---|---|---|---|---|---|
| 0159 | 00 | EXIT | - | B | YES | 000 | | |
| 0160 | 01 | SQRT | DT | - | | 010 | | |
| 0161 | 02 | SIN | DT | - | | 020 | SINE | |
| 0162 | 03 | COS | DT | - | | 030 | COSINE | |
| 0163 | 04 | ASIN | DT | - | | 040 | ARCSIN | |
| 0164 | 05 | ACOS | DT | - | | 050 | ARCCOS | |
| 0165 | 06 | DSQ | DT | - | | 060 | | |
| 0166 | 07 | ROUND | DT | D | | 070 | | |
| 0167 | 10 | DCOMP | DT | - | | 100 | | |
| 0168 | 11 | VDEF | DT | V | | 110 | | |
| 0169 | 12 | UNIT | V | - | | 120 | | |
| 0170 | 13 | ABS | DT | - | | 130 | | |
| 0171 | 14 | VSQ | V | D | | 140 | | |
| 0172 | 15 | STADR | - | - | YES | 150 | | |
| 0173 | 16 | RVQ | - | U | YES | 160 | ITCQ | IF QPRET POINTS TO ERASABLE, USE GOTO QPRET , NOT RVQ. |
| 0174 | 17 | PUSH | - | - | | 170 | | |
| 0175 | 20 | VCOMP | V | - | | 100 | | |
| 0176 | 23 | ABVAL | V | D | | 130 | | |

P0177 SUFFIX 100 CODES, SHORT SHIFT OPERATIONS.

| R0178 | | | MODE | OCT CODE |
|---|---|---|---|---|
| 0179 | 00 | SL1R | D | 004 |
| 0180 | 01 | SR1R | D | 014 |
| 0181 | 02 | SL1 | DT | 024 |
| 0182 | 03 | SR1 | DT | 034 |
| 0183 | 04 | SL2R | D | 044 |
| 0184 | 05 | SR2R | D | 054 |
| 0185 | 06 | SL2 | DT | 064 |
| 0186 | 07 | SR2 | DT | 074 |
| 0187 | 10 | SL3R | D | 104 |
| 0188 | 11 | SR3R | D | 114 |
| 0189 | 12 | SL3 | DT | 124 |
| 0190 | 13 | SR3 | DT | 134 |
| 0191 | 14 | SL4R | D | 144 |
| 0192 | 15 | SR4R | D | 154 |
| 0193 | 16 | SL4 | DT | 164 |
| 0194 | 17 | SR4 | DT | 174 |
| 0195 | 20 | VSL1 | V | 004 |
| 0196 | 21 | VSR1 | V | 014 |
| 0197 | 22 | VSL2 | V | 024 |
| 0198 | 23 | VSR2 | V | 034 |
| 0199 | 24 | VSL3 | V | 044 |
| 0200 | 25 | VSR3 | V | 054 |
| 0201 | 26 | VSL4 | V | 064 |
| 0202 | 27 | VSR4 | V | 074 |
| 0203 | 30 | VSL5 | V | 104 |
| 0204 | 31 | VSR5 | V | 114 |
| 0205 | 32 | VSL6 | V | 124 |
| 0206 | 33 | VSR6 | V | 134 |
| 0207 | 34 | VSL7 | V | 144 |
| 0208 | 35 | VSR7 | V | 154 |
| 0209 | 36 | VSL8 | V | 164 |
| 0210 | 37 | VSR8 | V | 174 |

R0211 STORE CODES, ADDRESS CONSTANTS. COMPLEMENTED IF POSITIONED AS THE OPERAND OF A STADR CODE.

| R0213 R0214 | | ADDR TYPE | PUSH UP | MODE OUT | OCTAL CODE | INDEX,1 ADDITIVE | INDEX,2 ADDITIVE | LOAD* ADDITIVE | | ADDRESS CODES |
|---|---|---|---|---|---|---|---|---|---|---|
| 0216 | 00-02 | STORE | E | - | - | 00000 | 02000 | 04000 | - | A14 SEE SUFFIX 01 CODES. |
| 0218 | 03-10 | STODL | E+A14 | YES | D | 06000 | 02000 | 04000 | 06000 | A SEE SUFFIX 10 CODES. |
| 0220 | 11-16 | STOVL | E+A14 | YES | V | 22000 | 02000 | 04000 | 06000 | E SEE SUFFIX 10 CODES. |
| 0222 | 17 | STCALL | E+A | NO | U | 36000 | - | - | - | |

R0001 SUFFIX 01 CODES. INDEXABLE (EXCEPT SETPD) BY ADDING 10 TO SUFFIX. FOR A KEY TO DATA MODES, SEE PAGE 2.

| R0002 R0003 | | | ADDR TYPE | PUSH UP | MODE IN | OP MODE | MODE OUT | RH OP | OCT CODE | OCT* CODE | ALTERNATE SPELLING |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0005 | 00 | VLOAD | A14 | YES | - | V | V | | 001 | 003 | |
| 0007 | 01 | TAD | A14 | YES | DT | T | - | | 005 | 007 | |
| 0009 | 02 | SIGN | E | YES | - | D | - | | 011 | 013 | |
| 0011 | *03 | VXSC | A14 | YES | DT/V | V/D | V | | 015 | 017 | |
| 0013 | *04 | CGOTO | E+F | NO | - | S | U | YES | 021 | 023 | |
| 0015 | 05 | TLOAD | A14 | YES | - | T | T | | 025 | 027 | |
| 0017 | 06 | DLOAD | A14 | YES | - | D | D | | 031 | 033 | |
| 0019 | 07 | V/SC | A14 | YES | DT/V | V/D | V | | 035 | 037 | |
| 0021 | 10 | SLOAD | A14 | NO | - | S | D | | 041 | 043 | |
| 0023 | 11 | SSP | E+C | NO | - | S | - | | 045 | 047 | |
| 0025 | 12 | PDDL | A14 | YES | - | D | D | | 051 | 053 | |
| 0027 | 13 | MXV | A14 | NO | V | M | - | | 055 | 057 | |
| 0029 | 14 | PDVL | A14 | YES | - | V | V | | 061 | 063 | |
| 0031 | 15 | CCALL | E+F | NO | - | S | I | YES | 065 | 067 | |
| 0033 | 16 | VXM | A14 | NO | V | M | - | | 071 | 073 | |
| 0035 | 17 | NORM | E | NO | DT | S | - | | 075 | 077 | SLC |
| 0036 | 20 | DMPR | A14 | YES | DT | D | D | | 101 | 103 | |
| 0038 | 21 | DDV | A14 | YES | DT | D | - | | 105 | 107 | |
| 0040 | 22 | BDDV | A14 | YES | DT | D | - | | 111 | 113 | |
| 0042 | 23 | (GEN SHIFT) | | | | | | | | | |
| 0044 | 24 | VAD | A14 | YES | V | V | - | | 121 | 123 | |
| 0046 | 25 | VSU | A14 | YES | V | V | - | | 125 | 127 | |
| 0048 | 26 | BVSU | A14 | YES | V | V | - | | 131 | 133 | |
| 0049 | 27 | DOT | A14 | YES | V | V | D | | 135 | 137 | |
| 0050 | 30 | VXV | A14 | YES | V | V | - | | 141 | 143 | |
| 0052 | 31 | VPROJ | A14 | YES | V | V | - | | 145 | 147 | |
| 0054 | 32 | DSU | A14 | YES | DT | D | - | | 151 | 153 | |
| 0055 | 33 | BDSU | A14 | YES | DT | D | - | | 155 | 157 | |
| 0056 | 34 | DAD | A14 | YES | DT | D | - | | 161 | 163 | |
| 0057 | 35 | | | | | | | | | | |
| 0058 | 36 | DMP | A14 | YES | DT | D | - | | 171 | 173 | |
| 0059 | *37 | SETPD | V | NO | - | S | - | | 175 | --- | |
| 0060 | 40 | CCLRB | E+F | NO | - | S | B | YES | 065 | 067 | |

ADDRESS CODES
(167777 WILL BE LAST ACM ADDR)

A14 ANY 14-BIT ADDRESS -- 0-52, 100-3777, IF LOCATION IN BANK 17 OR LESS THEN 20000-47776, IF LOCATION IN BANK 22 OR MORE THEN 54000-167777. STORED IN ARC-CCS FASHION, COMPLEMENTED IF INDEXED BY X2.
*** SEE ALSO E & F BELOW. ***

E ERASABLE -- 0-52, 100-3777. STORED IN ARC-CCS FASHION, COMPLEMENTED IF INDEXED BY X2. **********
ALL INTERPRETIVE ADDRESSES REFERRING TO ERASABLE ARE PUT INTO ECADR (11-BIT) FORM AND SO MAY REFER TO ANY E-BANK.

F FIXED -- 20000-167777. STORED AS IS. **********
ALL INTERPRETIVE ADDRESSES REFERRING TO FIXED ARE PUT INTO FCADR FORM BEFORE ALTERATIONS SUCH AS TRUNCATING TO 14 BITS.

V VAC AREA -- 0-52, ARC-CCS.

C CONSTANT -- ANY TYPE OF SINGLE-PRECISION CONST. STORED AS IS.

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RH OP: INDICATES THOSE CODES THAT SHOULD BE RIGHT-HAND OPERATORS, OR OTHERWISE SHOULD BE ACCOMPANIED BY A BLANK RIGHT-HAND OPERATOR.

R0061 GENERAL SHIFT CODES, SUFFIX 01 CODE 23.

**** DEFINITION: ARC-CCS(X) = X + SGN(X)

| R0062 | | | MODE IN;OUT | UAL | UAU | IAL | IAU | ADAD | OCT | OCT* |
|---|---|---|---|---|---|---|---|---|---|---|
| 0064 | 0 | SL | DT;- | -51 | 51 | -177 | 177 | 20200 | 115 | 117 |
| 0066 | 1 | SR | DT;- | -51 | 51 | -177 | 177 | 20600 | 115 | 117 |
| 0068 | 2 | SLR | DT;D | -34 | 15 | -177 | 177 | 21200 | 115 | 117 |
| 0070 | 3 | SRR | DT;D | -15 | 34 | -177 | 177 | 21600 | 115 | 117 |
| 0072 | 4 | VSL | V;- | -34 | 33 | -177 | 177 | 20200 | 115 | 117 |
| 0074 | 5 | VSR | V;- | -33 | 34 | -177 | 177 | 20600 | 115 | 117 |

ADDRESS CODES

UAL -- UNINDEXED ADDRESS LOWER LIMIT
UAU -- UNINDEXED ADDRESS UPPER LIMIT
IAL -- INDEXED ADDRESS LOWER LIMIT
IAU -- INDEXED ADDRESS UPPER LIMIT
ADAD -- ADDITIVE FOR ADDRESS
FINISHED ADDRESS STORED LIKE A14 OR E.

P0078 SUFFIX 10 CODES, NOT INDEXABLE.

| R0079 R0080 | | | ADDR TYPE | MODE OUT | RH OP | OCT CODE | ALTERNATE SPELLING |
|---|---|---|---|---|---|---|---|
| 0082 | 00 | AXT,2 | C | - | | 002 | |
| 0084 | 01 | AXT,1 | C | - | | 006 | |
| 0086 | 02 | AXC,2 | C | - | | 012 | |
| 0088 | 03 | AXC,1 | C | - | | 016 | |
| 0090 | 04 | LXA,2 | E | - | | 022 | |
| 0091 | 05 | LXA,1 | E | - | | 026 | |
| 0093 | 06 | LXC,2 | E | - | | 032 | |
| 0095 | 07 | LXC,1 | E | - | | 036 | |
| 0096 | 10 | SXA,2 | E | - | | 042 | |
| 0098 | 11 | SXA,1 | E | - | | 046 | |
| 0100 | 12 | XCHX,2 | E | - | | 052 | |
| 0101 | 13 | XCHX,1 | E | - | | 056 | |
| 0102 | 14 | INCR,2 | C | - | | 062 | |
| 0104 | 15 | INCR,1 | C | - | | 066 | |
| 0106 | 16 | TIX,2 | A | - | | 072 | |
| 0107 | 17 | TIX,1 | A | - | | 076 | |
| 0108 | 20 | XAD,2 | E | - | | 102 | |
| 0109 | 21 | XAD,1 | E | - | | 106 | |
| 0110 | 22 | XSU,2 | E | - | | 112 | |
| 0111 | 23 | XSU,1 | E | - | | 116 | |
| 0112 | 24 | BZE | A | - | | 122 | |
| 0113 | 25 | GOTO | A | U | YES | 126 | GO TO |
| 0114 | 26 | BPL | A | - | | 132 | |
| 0115 | 27 | BMN | A | - | | 136 | |
| 0116 | 30 | RTB | F | U | | 142 | |
| 0117 | 31 | BHIZ | A | - | | 146 | |
| 0118 | 32 | CALL | A | I | YES | 152 | |
| 0119 | 33 | STQ | E | - | | 156 | ITA |
| 0120 | 34 | (SWITCH CODES) | | | | | |
| 0121 | 35 | | | | | | |
| 0122 | 36 | BOVB | F | - | | 172 | |
| 0123 | 37 | BOV | A | - | | 176 | |
| 012301 | *40 | CALRB | A | B | YES | 152 | |

ADDRESS CODES

A ANY 15-BIT ADDRESS -- 0-52, 100-3777, 20000-167777. STORED AS IS.

E ERASABLE -- 0-52, 100-3777. STORED AS IS.

F FIXED -- 20000-167777. STORED AS IS.

C CONSTANT -- ANY TYPE OF SINGLE-PRECISION CONST. STORED AS IS.

R01231 MODES IN

R01232 - DON'T CARE
R01233 D DOUBLE
R01234 DT DOUBLE OR TRIPLE
R01235 V VECTOR
R01236
R01237 NOTE THAT FOR VXSC AND V/SC,
R01238 IF MODE IN = DT, OP MODE = V, AND IF MODE IN = U OR V, OP MODE = D.

OPERAND MODES (FOR BEWARING END BANK)

D DOUBLE (2 WORDS)
M MATRIX (18 WORDS)
S SINGLE (1 WORD)
T TRIPLE (3 WORDS)
V VECTOR (6 WORDS)

MODES OUT

- NO CHANGE
B UNKNOWN, REQUIRE BASIC INSTR. NEXT.
D DOUBLE
I UNKNOWN, REQUIRE INTERPRETIVE NEXT.
T TRIPLE
U UNKNOWN
V VECTOR

P0124 SWITCH CODES, SUFFIX 10 CODE 34.

| R0125 R0126 | | | ADDR TYPE | MODE OUT | RH OP | OCT CODE | ADDRESS ADDITIVE | ALTERNATE SPELLING |
|---|---|---|---|---|---|---|---|---|
| 0128 | 00 | BONSET | SW+A | - | | 162 | 00000 | |
| 0130 | 01 | SETGO | SW+A | U | YES | 162 | 00020 | |
| 0132 | 02 | BOFSET | SW+A | - | | 162 | 00040 | |
| 0134 | 03 | SET | SW | - | | 162 | 00060 | |
| 0136 | 04 | BONINV | SW+A | - | | 162 | 00100 | |
| 0138 | 05 | INVGO | SW+A | U | YES | 162 | 00120 | |
| 0140 | 06 | BOFINV | SW+A | - | | 162 | 00140 | |
| 0142 | 07 | INVERT | SW | - | | 162 | 00160 | INV |
| 0144 | | | | | | | | |
| 0146 | 10 | BONCLR | SW+A | - | | 162 | 00200 | |
| 0148 | 11 | CLRGO | SW+A | U | YES | 162 | 00220 | |
| 0150 | 12 | BOFCLR | SW+A | - | | 162 | 00240 | |
| 0152 | 13 | CLEAR | SW | - | | 162 | 00260 | CLR |
| 0154 | 14 | BON | SW+A | - | | 162 | 00300 | |
| 0155 | 16 | BOFF | SW+A | - | | 162 | 00340 | BOF |

ADDRESS CODES

A ANY 15-BIT ADDRESS -- 0-52, 100-3777, 20000-167777. STORED AS IS.

SW SWITCH BIT NUMBER -- 0-357. STORED WITH SWITCH WORD NUMBER 0-17 (THE INTEGER QUOTIENT OF N/15) IN BITS 12-9 AND THE BIT-WITHIN-WORD NUMBER (00-16 OCTAL, THE REMAINDER OF N/15) IN BITS 4-1. THIS IS THE ONLY INSTANCE OF NUMBERING BITS FROM LEFT TO RIGHT. 357 = 239D.

R0156 SUFFIX 000 CODES, UNARY OPERATIONS.

| R0157 R0158 | | | MODE IN | MODE OUT | RH OP | OCT CODE | ALTERNATE SPELLING | |
|---|---|---|---|---|---|---|---|---|
| 0159 | 00 | EXIT | - | B | YES | 000 | | |
| 0160 | 01 | SQRT | DT | - | | 010 | | |
| 0161 | 02 | SIN | DT | - | | 020 | SINE | |
| 0162 | 03 | COS | DT | - | | 030 | COSINE | |
| 0163 | 04 | ASIN | DT | - | | 040 | ARCSIN | |
| 0164 | 05 | ACOS | DT | - | | 050 | ARCCOS | |
| 0165 | 06 | DSQ | DT | - | | 060 | | |
| 0166 | 07 | ROUND | DT | D | | 070 | | |
| 0167 | 10 | DCOMP | DT | - | | 100 | | |
| 0168 | 11 | VDEF | DT | V | | 110 | | |
| 0169 | 12 | UNIT | V | - | | 120 | | |
| 0170 | 13 | ABS | DT | - | | 130 | | |
| 0171 | 14 | VSQ | V | D | | 140 | | |
| 0172 | 15 | STADR | - | - | YES | 150 | | |
| 0173 | 16 | RVQ | - | U | YES | 160 | ITCQ | IF QPRET POINTS TO ERASABLE, USE GOTO QPRET , NOT RVQ. |
| 0174 | 17 | PUSH | - | - | | 170 | | |
| 0175 | 20 | VCOMP | V | - | | 100 | | |
| 0176 | 23 | ABVAL | V | D | | 130 | | |

P0177 SUFFIX 100 CODES, SHORT SHIFT OPERATIONS.

R0178

| | | | MODE IN | OCT | CODE | MODE OUT |
|---|---|---|---|---|---|---|
| 0179 | 00 | SL1R | DT | D | 004 | |
| 0180 | 01 | SR1R | DT | D | 014 | |
| 0181 | 02 | SL1 | DT | - | 024 | |
| 0182 | 03 | SR1 | DT | - | 034 | |
| 0183 | 04 | SL2R | DT | D | 044 | |
| 0184 | 05 | SR2R | DT | D | 054 | |
| 0185 | 06 | SL2 | DT | - | 064 | |
| 0186 | 07 | SR2 | DT | - | 074 | |
| 0187 | 10 | SL3R | DT | D | 104 | |
| 0188 | 11 | SR3R | DT | D | 114 | |
| 0189 | 12 | SL3 | DT | - | 124 | |
| 0190 | 13 | SR3 | DT | - | 134 | |
| 0191 | 14 | SL4R | DT | D | 144 | |
| 0192 | 15 | SR4R | DT | D | 154 | |
| 0193 | 16 | SL4 | DT | - | 164 | |
| 0194 | 17 | SR4 | DT | - | 174 | |
| 0195 | 20 | VSL1 | V | - | 004 | |
| 0196 | 21 | VSR1 | V | - | 014 | |
| 0197 | 22 | VSL2 | V | - | 024 | |
| 0198 | 23 | VSR2 | V | - | 034 | |
| 0199 | 24 | VSL3 | V | - | 044 | |
| 0200 | 25 | VSR3 | V | - | 054 | |
| 0201 | 26 | VSL4 | V | - | 064 | |
| 0202 | 27 | VSR4 | V | - | 074 | |
| 0203 | 30 | VSL5 | V | - | 104 | |
| 0204 | 31 | VSR5 | V | - | 114 | |
| 0205 | 32 | VSL6 | V | - | 124 | |
| 0206 | 33 | VSR6 | V | - | 134 | |
| 0207 | 34 | VSL7 | V | - | 144 | |
| 0208 | 35 | VSR7 | V | - | 154 | |
| 0209 | 36 | VSL8 | V | - | 164 | |
| 0210 | 37 | VSR8 | V | - | 174 | |

R0211 STORE CODES, ADDRESS CONSTANTS. COMPLEMENTED IF POSITIONED AS THE OPERAND OF A STADR CODE.

| R0213 R0214 | | | ADDR TYPE | PUSH UP | MODE OUT | OCTAL CODE | INDEX,1 ADDITIVE | INDEX,2 ADDITIVE | LOAD* ADDITIVE | | ADDRESS CODES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0216 | 00-02 | STORE | E | - | - | 00000 | 04000 | 10000 | - | A14 | SEE SUFFIX 01 CODES. |
| 0218 | 03-04 | STODL | E+A14 | YES | D | 14000 | - | - | 04000 | A | SEE SUFFIX 10 CODES. |
| 0220 | 05-06 | STOVL | E+A14 | YES | V | 24000 | - | - | 04000 | E | SEE SUFFIX 10 CODES. |
| 0222 | 07 | STCALL | E+A | NO | U | 34000 | - | - | - | | |

P0225 HOW TO PATCH INTERPRETIVE CODING FOR SIMULATIONS
R0226 ----------

R0227 PATCHING INTERPRETIVE CODING IS EASY IF YOU LIKE COMPLEMENTING, OCTAL DOUBLING, AND OCTAL HALVING. THE
R0229 OP CODES IN A WORD ARE FIRST INTERCHANGED, THEN INCREMENTED, THEN CONCATENATED INTO A WORD, WHICH IS FINALLY
R0231 COMPLEMENTED.

R0232 FOR INSTANCE, TO CONVERT VAD* VXSC INTO OCTAL:

R0233 FIRST LOOK UP THE OCTAL CODES: 123 015
R0234 AND INTERCHANGE THEM: 015 123
R0235 INCREMENT BOTH CODES: 016 124
R0236 SHIFT 016 LEFT 7 BITS; 01600 X 2 = 03400
R0237 ADD IN THE OTHER CODE: 03524
R0238 AND COMPLEMENT THE WHOLE SCHMIER: 74253

R0239 IF THERE IS JUST ONE OP CODE, IT IS ACCOMPANIED BY AN UNINCREMENTED ZERO. TO CONVERT RVQ INTO OCTAL:

R0241 LOOK UP THE OP CODE: 160
R0242 INCREMENT IT: 161
R0243 FORM THE WORD: 00161
R0244 AND COMPLEMENT: 77616

R0245 WHEN LOOKING UP OP CODES, BE CAREFUL NOT TO TAKE A BLK2 OP CODE FROM THE AGC LIST OR VICE VERSA. **********

R0247 ADDRESS PECULIARITIES: ALL THE GENERAL SHIFT CODES HAVE THE SAME OCTAL CODE, 115 IF UNINDEXED OR 117
R0249 IF INDEXED. ALL THE SWITCH-BIT (FLAG) OPERATIONS USE OCTAL CODE 162. THE STORING OPERATIONS DON'T HAVE ANY OP
R0251 CODES AT ALL. IN THESE CASES THE OPERATION IS SPECIFIED BY AN ADDITIVE IN THE ADDRESS.

R0253 TO CONVERT AN ADDRESS 0 -5,2 THAT GOES WITH AN SRR* OP CODE:

R0254 LOOK UP THE ADDITIVE FOR SRR*: 21600
R0255 ADD IT TO THE ADDRESS VALUE: 21573
R0256 INCREMENT TO GET ARC-CSS FORM: 21574
R0257 SINCE INDEXED BY X2, COMPLEMENT: 56203

R0258 TO FORM THE ADDRESS OF A FLAG BIT, YOU NEED THE FLAGWORD NUMBER (0-15D) AND THE RESIDUE MODULO 15 OF
R0260 THE FLAG NUMBER. THAT IS, THE FLAG NUMBER F IS RELATED TO THE FLAGWORD NUMBER W AND TO THE BIT NUMBER B BY THE
R0262 EQUATION F = 15W + (15 - B). TO CONVERT THE FLAG NUMBER 200D WITH THE OP CODE CLRGO:

R0264 DIVIDE 200D BY 15D TO GET W: 15 OCTAL
R0265 THE REMAINDER ( = 15 - B) IS 5 OCTAL (IF YOU STARTED WITH THE INFO W = 13, B = 10, JUST CONVERT 15 - B).
R0267 SHIFT W LEFT 8 BITS: 15000/2 = 6400
R0268 ADD 15 - B: 6405
R0269 ADDITIVE FOR CLRGO = 00220: 06625

R0270 TO CONVERT A STODL* WITH AN ADDRESS OF E5,1567:

R0271 CONVERT THE ADDRESS TO ECADR FORM:
R0272 SHIFT THE EBANK LEFT 8: 5000/2 = 2400
R0273 ADD REL. ADDRESS 1567 - 1400: 2567
R0274 STODL* ADDITIVE = 14000 + 4000: 22567
R0275 (IF FOLLOWS STADR, COMPLEMENT: 55210)

P0276 OTHER INTERPRETIVE ADDRESSES ARE CADRS. TO MAKE A CADR FROM A PSEUDO-ADDRESS, SUBTRACT 10000. IF THE
R0278 RESULT IS OVER 77777 (BANKS 40-43), SUBTRACT 20000 MORE. TO CONVERT FBANK NOTATION INTO A CADR, REDUCE BANK 4X
R0280 TO THE CORRESPONDING 3X IF NECESSARY, SHIFT THE BANK NUMBER LEFT 10 BITS, SUBTRACT 2000 FROM THE SUBADDRESS, AND
R0282 ADD THE RESULTS. EXAMPLES:

R0283 (1) TO CONVERT 112233
R0284 SUBTRACT 10000; 102233
R0285 TOO BIG. SUBTRACT 20000: 62233

R0286 (2) TO CONVERT 41,3456
R0287 REDUCE BANK NUMBER INTO 30S; 31,3456
R0288 SHIFT BANK 10 LEFT: 31000 X 2 = 62000
R0289 ADD REL. ADDRESS = 3456 - 2000: 63456

END OF REVISION 9 OF PROGRAM DIGEST BY SIR TOBY BELCH

SYMBOL TABLE LISTING, INCLUDING PAGE NUMBER OF DEFINITION, AND NUMBER OF REFERENCES WITH FIRST AND LAST PAGE NUMBERS 

THERE ARE NO SYMBOLS IN THIS ASSEMBLY.

THE ASSEMBLY WAS GOOD;  MANUFACTURABLE BINARY RECORDS STORED ON EXPEROGS.